types of bridges evolved in the campaign are passed under review. One of the most remarkable types, from the point of view of lightness and ease of erection, was the Inglis bridge of identical bays of weldless steel tubes.

The chapter on temporary bridges is a really stirring account of typical bridging operations during the final advance of August to November, 1918. A succession of waterways had to be forced before each serious engagement. In one case a field company erected a trestle bridge of 80-ft. span within 500 yds. of the enemy line, completing it four hours before the attack was launched. No fewer than 539 heavy bridges were erected between August and November, 1918.

(3) The supply of stores necessarily developed not only in quantity, but also in variety, for "it came about that the R.E. were early regarded as the universal providers of everything that was not authorised equipment." By March 1919, more than 1,800,000 tons of R.E. stores of the most diverse nature had been sent over to the Western front. Road metal, camouflage, electric-light installations, and propaganda balloons, all figured in the lists. Constantly increasing experimental work on new devices was also carried out, and the statement of the results achieved is of considerable interest.

(4) This study of the nervous system of the Army in the recent war is the story of a service constantly "struggling with ever fresh developments and responsibilities: sometimes failing, more often succeeding, and always improving and learning." The need for continual adjustment of ideas and nimbleness of thought on the part of those directing the policy of signals has not ended with the war. Just as "the discovery of the magneto telephone by the General Staff was probably responsible for a revolution in staff methods as great as any that has ever occurred in the history of war," so may the developments of wireless telegraphy and telephony bring many new problems for the signal officer of the future. While recognising fully the strangle-hold that code and cipher exercised on the use of wireless during the greater part of the war, Major Priestley points out how, as shelling and bombing became more intense, wireless forced its way more and more into use and recognition. It is clearly his view that the signals of the future will be mainly wireless supported by line telegraphy and visual work.

Few remarks throw more light on the extent to which signals grew in complexity during the war and technical qualifications came to be required by front-line troops than the statement that at the end of the war, the battalion and battery signaller was expected to have more qualifications than those possessed by the line telegraphists of the Royal Engineers at the commencement of the war.

For its system of hastily improvising a large army this country paid the penalty that must needs accompany such a process. Had we been better organised to make full use of man-power and brain-power on a national emergency, Moseley could scarcely have been allowed to go to his gallant death at Gallipoli. He could have been so much more profitably employed in his corps either in developing wireless or in examining and combating the overhearing of telephone signals. Our slowness in the recognition of enemy overhearing, with all the unnecessary loss of life that it involved, is a natural sequel to our general unpreparedness for the great emergency of 1914.

Granted that we were not always first in the field in the early days of the war, we can, however, recognise fairly that lost time was well made up before the end. The close of the war found the Signal Service "efficient in its day and generation, as the *personnel* of the highly trained units of the original Expeditionary Force had been in theirs."

Our Bookshelf.

Nut Growing. By R. T. Morris. Pp. x+236. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1921.) 13*s*. net.

THERE is little of the dry manual about this useful volume. The author has a "message" to give to a world seeking new foodstuffs, and though he occupies forty pages in introducing the subject, his preliminary remarks are to the point and well worth reading by those interested. Briefly, the book is a practical guide to the commercial cultivation of trees bearing edible nuts, and is addressed to growers in America, where in recent years much attention has been given to this industry. The nuts dealt with include hickories, walnuts, hazels, chestnuts, pine nuts, and almonds. Reference is made to the devastation caused in the forests of American chestnut (*Castanea dentata*) by the fungus *Endothia parasitica*, which threatens to destroy the species unless resistant stocks can be discovered and successfully propagated. The author claims to have produced hybrids between this tree and the chinkapin (*Castanea pumila*) which are highly resistant to the fungus, and bear nuts of good size and quality. An important section on propagation deals with the practical aspects of nut cultivation, and has been written mainly with the object of describing a special system of grafting, which is clearly illustrated in a series of excellent plates.

A Handbook on Cotton and Tobacco Cultivation in Nyasaland: A Guide to Prospective Settlers. By J. S. J. McCall. Pp. 85. (Zomba, Nyasaland: The Government Printer, 1920.)

IT is greatly to be regretted that the late Mr. McCall did not long survive his promotion from the post of

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Director of Agriculture in Nyasaland to the corresponding directorship in the newly acquired Tanganyika Territory. His little book is a useful summary of practical information on cotton and tobacco growing in Nyasaland, and contains just those particulars which experience shows are required by would-be planters with little or no previous knowledge of these crops.

The greater part of the book is devoted to cotton, a crop of which Mr. McCall had much experience. Nyasaland long-staple cotton has gained a high reputation and finds a ready market. A controlling factor in production is transport, and on this point the author expresses the view that "the progress of cotton growing in Africa to-day depends more than ever on railways and mechanical transport. The cultivation of tobacco has become one of the most important planting industries of the Protectorate, and the leaf (Virginian type) is well known in this country. The information given regarding the growing and curing of this crop forms a useful first guide to a subject requiring careful study.

A Popular Chemical Dictionary: A Compendious Encyclopaedia. By C. T. Kingzett. Second edition. Pp. viii+539. (London: Baillière, Tindall and Cox, 1921.) 21*s.* net.

THE first edition of this useful book has been exhausted in less than one year, thus proving that it filled a vacancy in chemical literature. A careful perusal of the new edition shows that much new material has been added which enhances considerably the utility of the book. In particular the chief constants of most of the chemicals named have been added, and the work now forms a handy and popular book of reference embracing in one moderately sized volume a mass of up-to-date information on practically every branch of chemistry and allied sciences.

The information is imparted in a clear and interesting manner, freed so far as possible from technicalities. Consequently any one wishing to ascertain the meaning of a term or definition, or the nature of any material or subject in the scope of chemistry or mineralogy, will find without difficulty and within a few seconds the information required—information which is often difficult to lay hands on immediately when embedded in the pages of a large text-book.

G. M.

The Adjustment and Testing of Telescope Objectives. Third edition. Pp. 123+3 plates. (York and London: T. Cooke and Sons, Ltd., 1921.)

THIS volume is the third edition of a book first published in 1891. The favourable reception accorded to the earlier editions, and the extent of their circulation, have encouraged the publishers to re-issue the work with the amplifications necessary to bring it up to date.

The book deals with the simplest and most effective means of detecting flaws in telescope objectives, as well as the various maladjustments and imperfections of mounting, which may prevent an observer from obtaining the best results from his telescope. Different types of objective are treated separately, a special section being devoted to the Cooke triple photo-visual objective. The points to which attention is given include squaring-on, achromatism, astigmatism, spherical and zonal aberration, mechanical strains, and other smaller, but equally important, matters. There is also a short chapter on the general treatment of objectives. The volume concludes with reprints of three papers by Mr. H. Dennis Taylor, originally presented to the Royal Astronomical Society, dealing with achromatism and the secondary colour aberrations of refractors.

The book is very clearly written, and should prove of great use, not only in detecting faults in imperfect objectives, but also in enabling an observer to determine whether defects in star images are due to the objective or to the manner of its setting. It should appeal especially to the amateur astronomer possessing a small refractor. The directions for testing and adjustment are of the simplest possible character, and involve keen observation rather than mechanical skill.

The publishers have done a great service to astronomy in preparing such a useful little book.

Bibliographia Agrogeologica: Essay of a Systematic Bibliography of Agro-Geology. By Adolf Wulff. (Mededeelingen van de Landbouwhoogeschool en van de Daaraan Verbonden Instituten, Deel 20.) Pp. iv+285. (Wageningen: H. Veenman, 1921.) 4·50 florins.

THE study of the soil has developed so rapidly in recent years that no student can keep pace with the output of papers, nor can the best card index of an individual worker be relied upon as being complete. The necessity for such adventitious aid as is afforded by a bibliography has long become pressing, and this is now supplied by Dr. Adolf Wulff. No fewer than 3300 titles are given, the papers being drawn from more than 600 journals, and the list goes up to November 1, 1919. A satisfactory classification is adopted, so that the student will have no difficulty in finding his way through the bibliography even if he has to consult it only occasionally.

Although the title suggests to English ears only the geological or mineralogical side, the index covers the whole ground dealt with in this country by soil investigators, including soil organisms, soil organic matter, and the relations of soil to the growing plant. The English is remarkably free from errors, and the few misprints will cause no difficulty.

Prof. J. van Baren contributes an interesting discussion on soil problems, bringing together a considerable amount of work which is little known, and forming a useful introduction to the whole volume. Altogether the book is one which can safely be recommended to students and investigators in the subject.

E. J. R.

Patents and Chemical Research. By H. E. Potts. Pp. x+198. (Liverpool: University Press, 1921.) 8*s.* 6*d.* net.

A PATENT, like any other form of contract, depends very largely for its value upon the skill with which it has been drawn up. The form of wording, in fact, may be quite as important as the subject-matter.

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